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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,108	11/14/2003	Cheng-Tsung Yu	0941-0752P	8218
2292	7590	09/07/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			MOORE, KARLA A	
			ART UNIT	PAPER NUMBER

1763

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/712,108	YU ET AL.	
	Examiner	Art Unit	
	Karla Moore	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9,11-18 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9,11-18 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites the limitation "the other portion". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
5. Claims 1-2, 4-7 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,411,624 to Hirano et al. in view of U.S. Patent No. 4,793,975 to Drage.
6. Hirano et al. disclose a pedestal supporting a substrate in a plasma chamber as claimed in Figure 1 substantially as claimed and comprising: an insulating base (16; column 4, row 32) comprising a recess; a conductive layer (12, which is used as an electrode and therefore must be conductive; column

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4, rows 17-20 and column 5, rows 8-14) comprising a bottom portion with a width accommodated in the recess and an upper portion with an upper width not accommodated in the recess; and a ceramic cover (22 and 24; column 5, rows 45-52) at least partially covering the conductive layer, the conductive layer being covered when the pedestal supports a substrate.

7. Regarding the height of the cover ring, Hirano et al. teach that the height of the ceramic cover can be adjusted to achieve a desired etching rate. It would have been obvious to one of ordinary skill in the art to adjust the height as needed (including a height where the cover is lower than a substrate) if desired. See column 7, rows 19-49 of Hirano et al.

8. However, Hirano et al. fail to teach the ceramic cover comprises aluminum oxide.

9. Drage teaches providing an aluminum oxide ceramic cover for a conductive layer of a substrate support pedestal for the purpose of improving uniformity and etch rate in cooperation with other elements of a plasma reactor (column 1, row 60 through column 2, row 2 and column 2, rows 46-62). It is taught that the material for the cover can be chosen depending on the function to be performed.

10. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a cover comprising aluminum oxide in Hirano et al. in order to improve uniformity and etch rate in cooperation with other elements of a plasma reactor as taught by Drage.

11. With respect to claim 2, the upper width is less than the bottom width and a diameter of the substrate (Figures 1 and 2).

12. With respect to claim 4, the ceramic cover further overlies the insulating base (Figure 1).

13. With respect to claim 5, the ceramic cover further comprises an opening exposing the conductive layer (see Figure 2).

14. With respect to claim 6, the ceramic cover overlies the bottom portion of the conductive layer and further comprises a hollow portion (central portion) accommodating the upper portion of the conductive layer (see Figures 1 and 2).

15. With respect to claim 7, the ceramic cover is ring shaped (column 5, rows 45-52).

16. With respect to claim 11, Hirano et al. further disclose in Figures 1 and 2, a pedestal supporting a substrate in a plasma chamber, comprising: an insulating base (16) having a recess; a ceramic cover (22 and 24) overlying the insulating base and partially veering the conductive layer; wherein the conductive

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layer is covered when the pedestal supports a substrate and the conductive layer further comprises an upper portion protruding from the recess.

17. With respect to claim 12, the upper portion is with a width less than the diameter of the substrate. Examiner notes that while the prior art discloses processing a substrate to be processed with a diameter greater than that of the upper portion, the courts have ruled that inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims. In re Young, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

18. With respect to claim 13, the width of the upper portion is less than the width of a *lower* portion of the conductive layer.

19. With respect to claim 14, the ceramic cover comprises a hollow (central) portion accommodating the upper portion of the conductive layer.

20. With respect to claim 15, the ceramic cover further comprises a hollow portion accommodating the upper portion of the conductive layer and exposing *the upper* portion of the conductive layer (Figures 1 and 2).

21. With respect to claim 16, the ceramic cover is ring shaped (column 5, rows 45-52).

22. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano et al. and Drage as applied to claims 1-2, 4-7 and 11-16 above and further in view of Applicant's admitted prior art (AAPA).

23. Hirano et al. and Drage disclose a pedestal substantially as claimed and as described above.

24. However, Hirano et al. and Drage fail to teach the insulating base comprised of silicon dioxide.

25. Applicant's admitted prior art teaches that it is known to provide a base of a pedestal constructed of silicon oxide to take advantage of the material's insulative property (page 1).

26. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the insulating base constructed of silicon oxide in Hirano et al. and Drage in order to take advantage of the material's insulative property as taught by AAPA.

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27. Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano et al. and Drage as applied to claims 1-2, 4-7 and 11-16 above and further in view of U.S. Patent Publication No. 2005/0098120 A1 to Maki.

28. Hirano et al. and Drage disclose the invention substantially as claimed and as described above.

29. However, Hirano et al. and Drage fail to teach the conductive layer as titanium. Maki teaches the use of titanium as a pedestal material for the purpose of forming a temperature controlling section with superior thermal conductivity, electric conductivity and formability (paragraph 46).

30. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided titanium as a construction material for the conductive layer in Hirano et al. and Drage in order to form a pedestal having a temperature controlling section with superior thermal conductivity, electrical conductivity and formability as taught by Maki.

31. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,411,624 to Hirano et al. in view of Applicant's Admitted Prior Art, U.S. Patent Publication No. 2005/0098120 A1 to Maki and U.S. Patent No. 4,793,975 to Drage.

32. Hirano et al. disclose a pedestal supporting a substrate in a plasma chamber substantially as claimed in Figure 1 and comprising: an insulating base (16; column 4, row 32) comprising a recess; a conductive layer (12, which is used as an electrode and therefore must be conductive; column 4, rows 17-20 and column 5, rows 8-14) having a bottom portion embedded in the recess and an upper portion, narrower than the bottom portion and the substrate, protruding from the recess; and a ring-shaped ceramic cover (22 and 24; column 5, rows 45-52) having a hollow (central) portion accommodating the upper portion or the bottom portion of the conductive layer; wherein the conductive layer is covered when the pedestal supports the substrate.

22. Regarding the height of the cover ring, Hirano et al. teach that the height of the ceramic cover can be adjusted to achieve a desired etching rate. It would have been obvious to one of ordinary skill in the art to adjust the height as needed (including a height where the cover is lower than a substrate) if desired. See column 7, rows 19-49 of Hirano et al.

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33. However, Hirano et al. fail to teach the insulating base comprised of silicon dioxide.

34. Applicant's admitted prior art teaches that it is known to provide a base of a pedestal constructed of silicon oxide to take advantage of the material's insulative property (page 1).

35. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the insulating base constructed of silicon oxide in Hirano et al. in order to take advantage of the material's insulative property as taught by AAPA.

36. Hirano et al. and AAPA disclose the invention substantially as claimed and as described above.

37. However, Hirano et al. and AAPA fail to teach the conductive layer as titanium. Maki teaches the use of titanium as a pedestal material for the purpose of forming a temperature controlling section with superior thermal conductivity, electric conductivity and formability (paragraph 46).

38. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided titanium as a construction material for the conductive layer in Hirano et al. and AAPA in order to form a pedestal having a temperature controlling section with superior thermal conductivity, electrical conductivity and formability as taught by Maki.

39. Hirano et al., AAPA and Maki disclose the invention substantially as claimed and as described above.

40. However, Hirano et al., AAPA and Maki fail to teach the ceramic cover comprises aluminum oxide.

41. Drage teaches providing an aluminum oxide ceramic cover for a conductive layer of a substrate support pedestal for the purpose of improving uniformity and etch rate in cooperation with other elements of a plasma reactor (column 1, row 60 through column 2, row 2 and column 2, rows 46-62). It is taught that the material for the cover can be chosen depending on the function to be performed.

42. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a cover comprising aluminum oxide in Hirano et al., AAPA and Maki in order to improve uniformity and etch rate in cooperation with other elements of a plasma reactor as taught by Drage,

43. With respect to claim 21, the ceramic cover further comprises a hollow portion accommodating the upper portion of the conductive layer and exposing *the upper* portion of the conductive layer (Figures 1 and 2).

Response to Arguments

44. Applicant's arguments filed 19 June 2006, with respect to the 112 rejection of claim 13, have been fully considered but they are not persuasive. Examiner maintains the position that the lack of antecedent basis in the claims renders the claim unclear and therefore the rejection is maintained. As the claim now reads it is not clear what width of what portion is to be compared to the width of the upper portion.

45. Applicant's arguments with respect to the art rejections regarding the combination of Hirano et al. and Drage are not convincing, either. Hirano et al. teach that the height of the ceramic cover can be adjusted to achieve a desired etching rate. It would have been obvious to one of ordinary skill in the art to adjust the height as needed (including a height where the cover is lower than a substrate) if desired. Further, Hirano et al. teach that it is not imperative for the cover ring to be conductive. Like the height of the of the cover ring, the material of construction of the cover ring (including even insulating materials) can be chosen based on desired processing results. See column 7, rows 19-49 of Hirano et al.

Conclusion

46. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

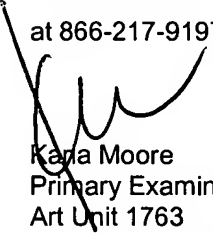
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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore
Primary Examiner
Art Unit 1763
1 September 2006